

# Research overview of hydrogen production from biomass: A bibliometric analysis of the research published during the 1979-2019 period

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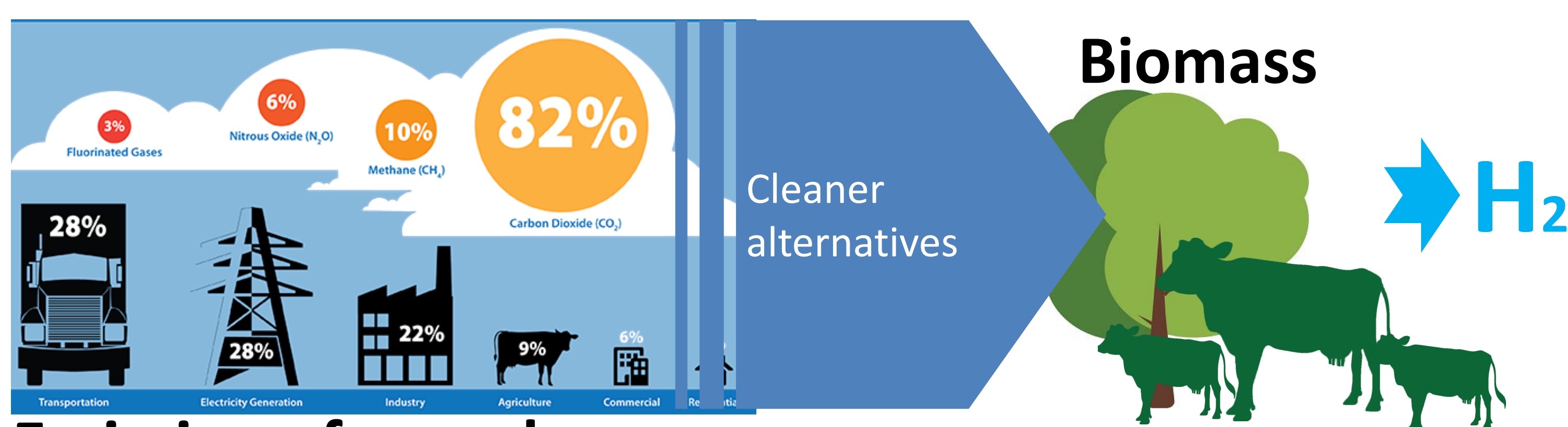
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## 1. Introduction

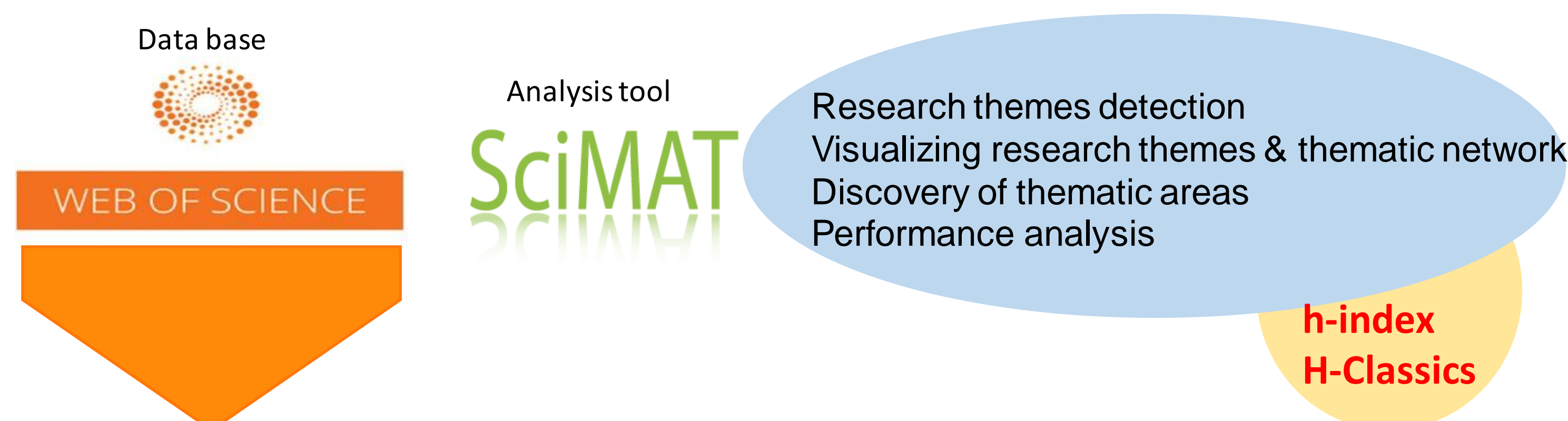


## Emission of greenhouse gases

### Aim

To analyze and illustrate the evolution of the bio-mass-based H<sub>2</sub> production field and its research themes by bibliometric techniques for 1979-2019 period.

## 2. Methodology and Dataset



TITLE-ABS-KEY ("hydrogen production from bio-mass" OR "hydrogen from biomass" OR "biomass for hydrogen production" OR "hydrogen production processes from biomass" OR "hydrogen production techniques from biomass" OR "hydrogen production methods from biomass" OR "hydrogen production technologies from biomass")

### 1979 – 2019 (March 13): 876 publications

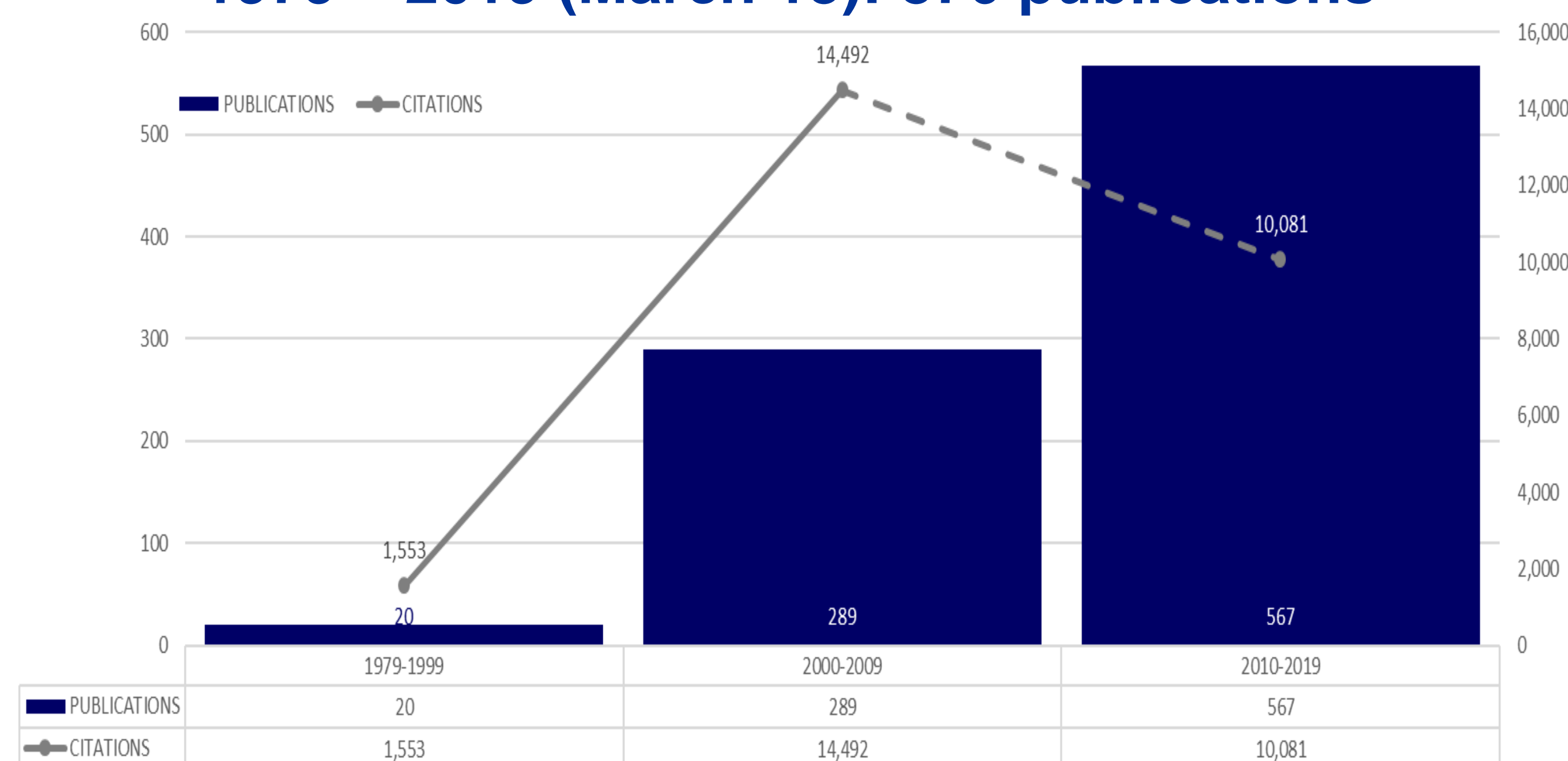


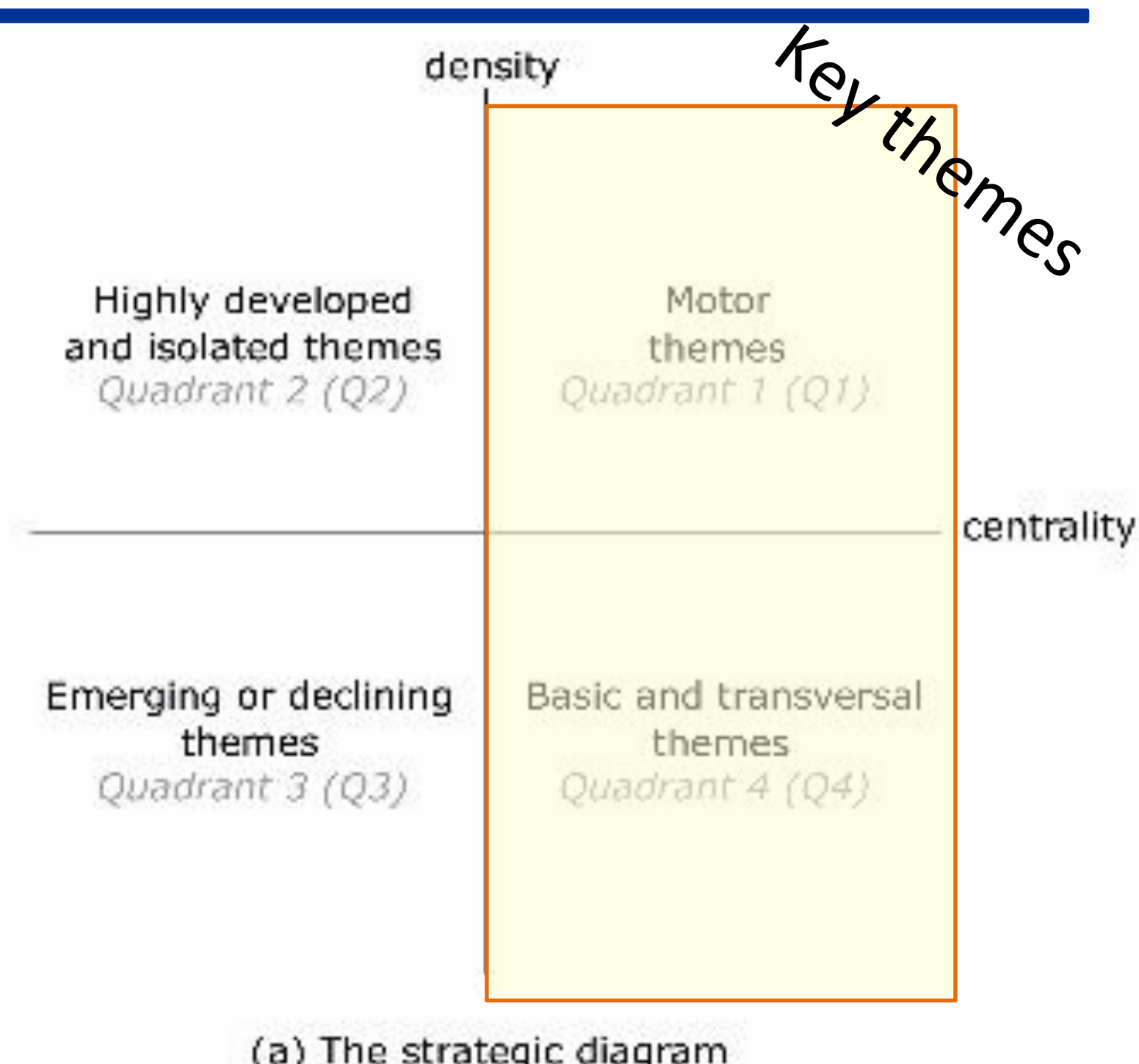
Fig 1. Distribution of publications and citations related to biomass-based hydrogen production per year

## 3. Results and Discussions

Analyzed bibliometric indicators:

- Publications & Received citations: to evaluate scientific growth

- Most cited articles & Authors, Journals, Research areas: to asses the impact of publications

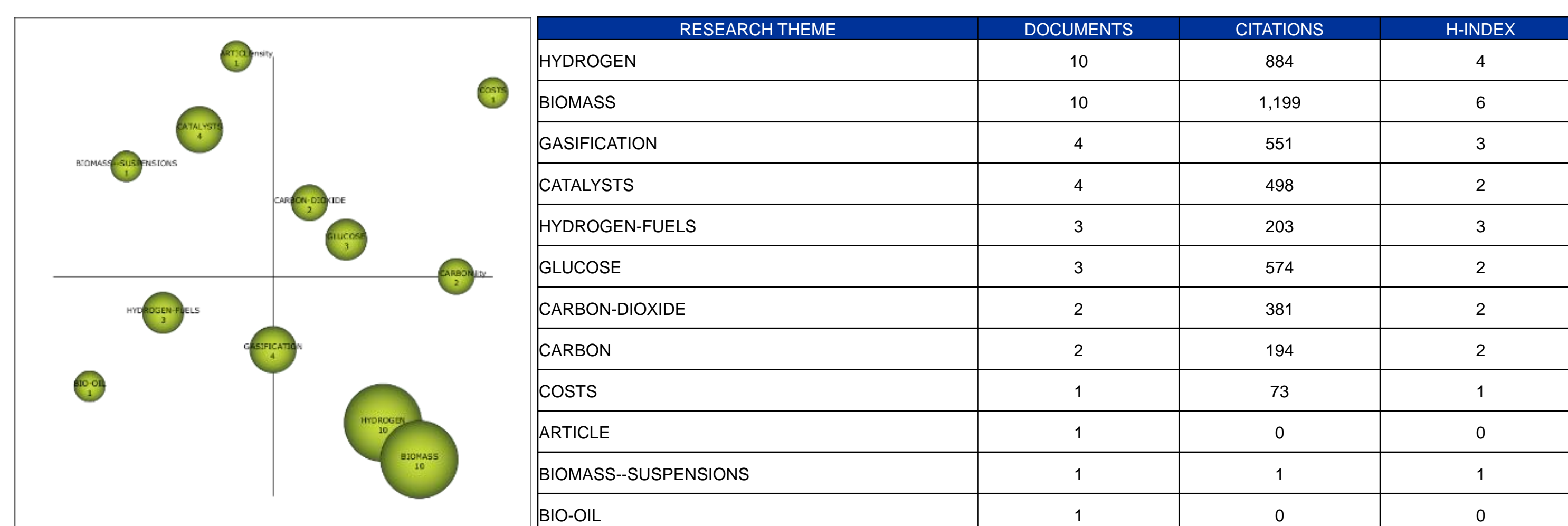


The sphere size is proportional to the number of published documents associated with each research themes

### STRATEGIC DIAGRAM AND BIBLIOMETRIC PERFORMANCE

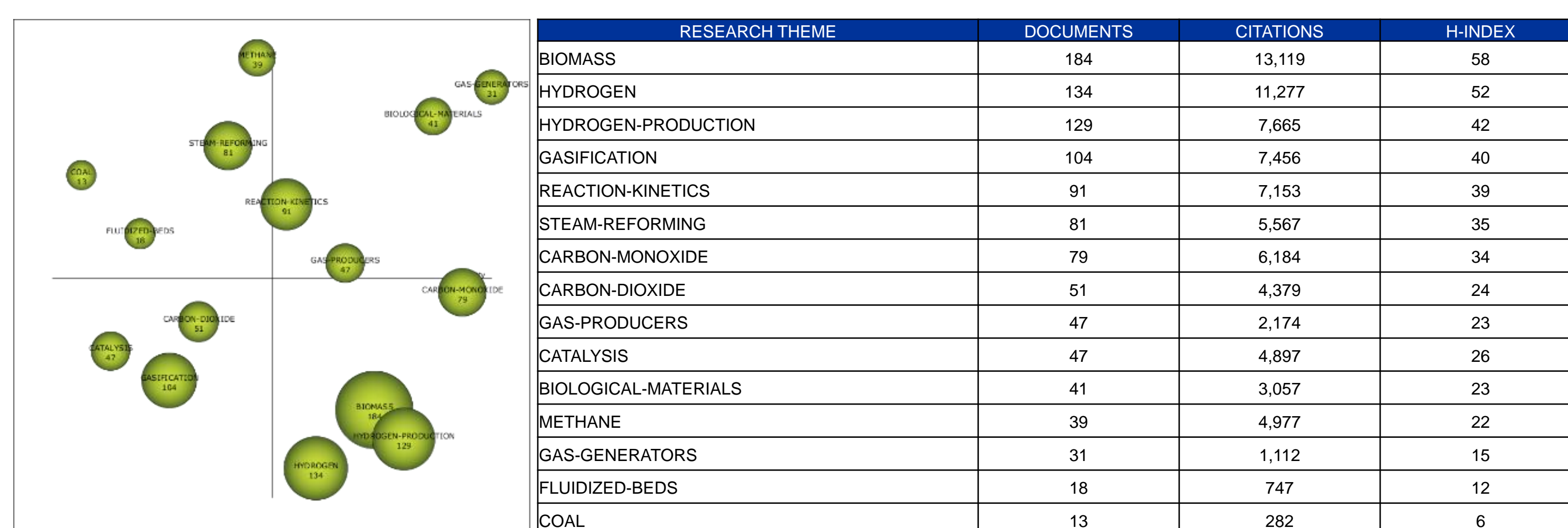
Strategic diagram and bibliometric performance from 1979 to 1999

- Low number of publications
- 12 themes identified
- 7 key themes: CARBON-DIOXIDE, GLUCOSE, COSTS, CARBON, GASIFICATION, HYDROGEN and BIOMASS.



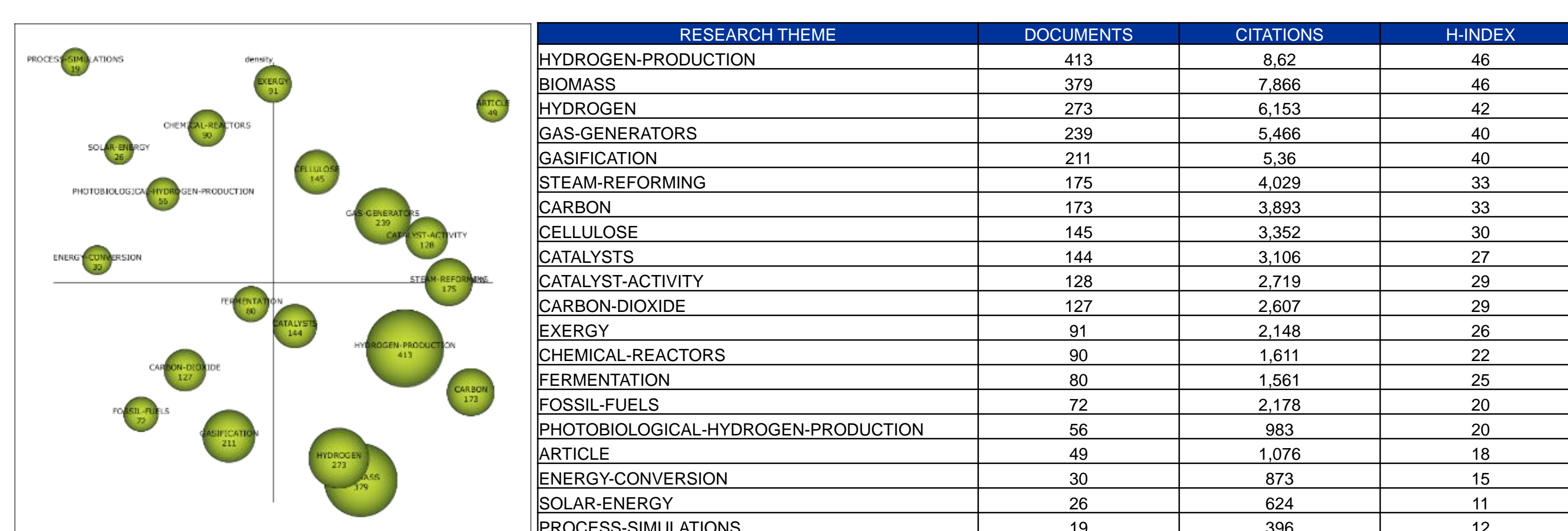
### Strategic diagram and bibliometric performance from 2000 to 2009

- 15 themes identified
- 8 key themes: GAS-GENERATORS, BIOLOGICAL-MATERIALS, REACTION-KINETICS, GAS-PROCEDURES, CARBON-MONOXIDE, BIOMASS, HYDROGEN and HYDROGEN-PRODUCTION.



### Strategic diagram and bibliometric performance from 2010 to 2019

- 12 themes identified
- 11 key themes: EXERGY, ARTICLE, CELLULOSE, GAS-GENERATORS, CATALYST-ACTIVITY, STEAM-REFORMING, CATALYSTS, HYDROGEN-PRODUCTION, CARBON, HYDROGEN and BIOMASS.



### Whole period (1979-2019)

Motor themes and Basic and transversal themes that are considered key to structure the field of research are (THEME (occurrence, number of publications and citations)): **BIOMASS** (3; 573; 22,184), **HYDROGEN** (3; 417; 901,430), **HYDROGEN-PRODUCTION** (2; 542; 16,285), **GAS-GENERATORS** (2; 270; 6,578), **CARBON** (2; 175; 197,893), **STEAM-REFORMING** (1; 175; 4,029), **CELLULOSE** (1; 145; 3,352), **CATALYSTS** (1; 144; 3,106), **CATALYST-ACTIVITY** (1; 128; 2,719), **EXERGY** (1; 91; 2,148), **REACTION-KINETICS** (1; 91; 7,153), **CARBON-MONOXIDE** (1; 79; 6,184), **ARTICLE** (1; 49; 1,076), **GAS-PRODUCERS** (1; 47; 2,174), **BIOLOGICAL-MATERIALS** (1; 41; 3,057), **GASIFICATION** (1; 4; 551), **GLUCOSE** (1; 3; 574), **CARBON-DIOXIDE** (1; 2; 381) and **COSTS** (1; 1; 73).

## 4. Conclusions

- The size of literature related to biomass-based hydrogen production research showed a noteworthy increase in the past 40 years.
- It is expected that the interest will continue to grow and serve as a support to other knowledge areas such as energy, transport and sustainable technologies.